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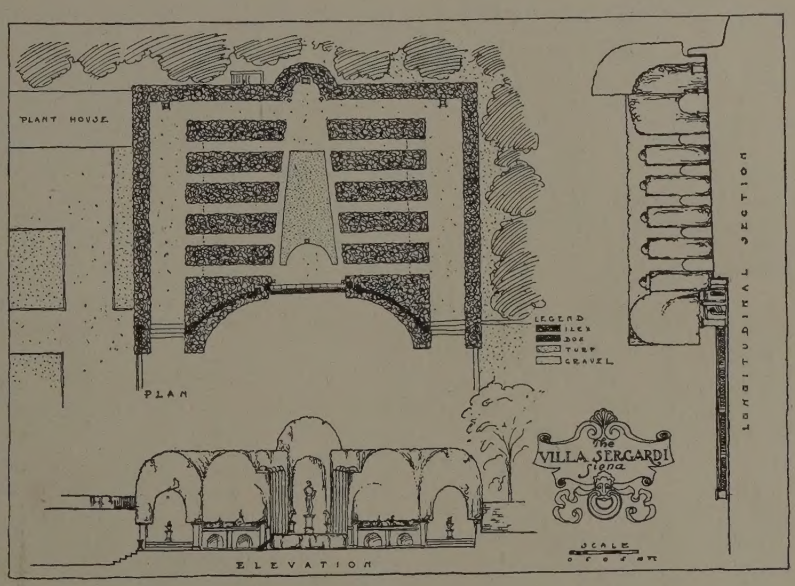
Four Tuscan Garden Theatres

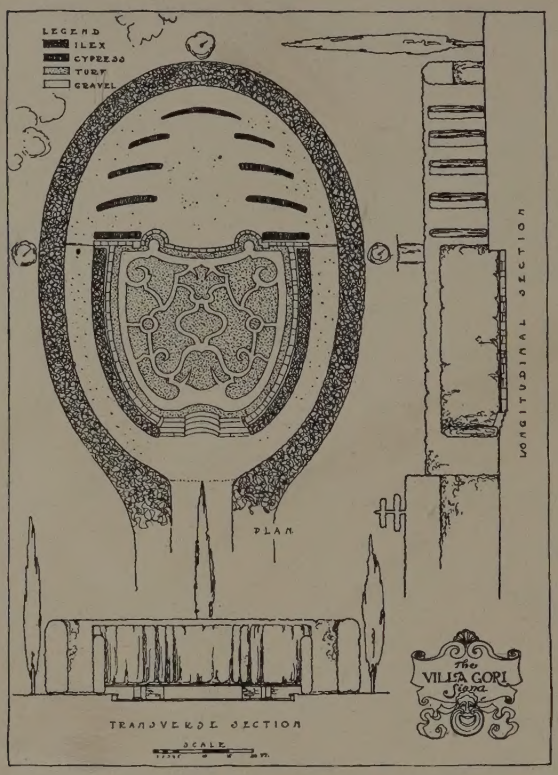
By Rhodes Robertson, A. B.

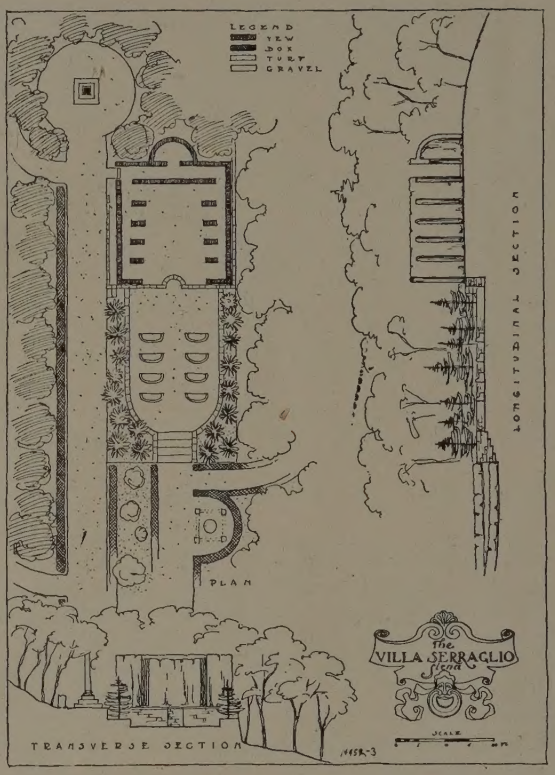
AN interesting feature of several gardens in Tuscany is the out-of-door theatre, consisting of a level space for the audience and a raised stage, with hedges of cypress, ilex, or yew forming wings. The whole is generally enclosed by a high hedge, so that it forms a separate unit and is placed at the end of an axis. These theatres seem to belong particularly to Tuscany—at least four which form the subject of this paper are in that region. Three of them—in the Villas Gori, Serraglio, and Sergardi—are in the environs of Siena and the fourth in the Villa of Marlia, near Lucca. No others are known in Italy, either near Rome or in Lombardy; but there is a large one near Palermo with cypress hedges and an elaborate "back-drop" of stucco architecture. In the Roman villas water plays the most important part and its abundance makes possible a great variety of effect. It may be that the lack of an abundant water supply made the Tuscan Garden Architects turn to other means for their effects. This is especially true of the Sienese gardens. They lack entirely the fountains and rushing water which are nearly the whole charm of villas Lante and d'Este.



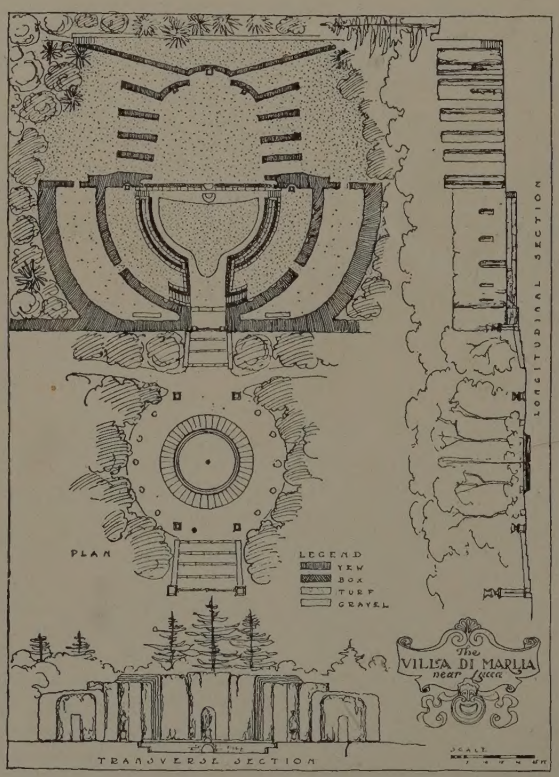
The theatres belong in general to the seventeenth century when the people were more intent on a garden full of fantasies and surprises than a well planned and consistent whole. So here, in place of water-organs, miniature cities, and grottos, one finds imitation play-houses fashioned out of greenery with wings and back-drop and prompter's hood. The nature of the problem does not lend itself to baroque architectural enormities, and the harmony of green turf and hedges and gravel paths produces a charming effect. These Tuscan gardens are not elaborate and the theatre is generally the chief point of interest. The stage, already set, strikes one's imagination forcibly as it appears at the end of a vista, and the possibilities of a representation against such a background seem manifold.

Of the four examples, that of the Villa Gori is the best known and also the most successful. The villa lies on a ridge about twenty minutes' walk from Siena outside the Porta Ovile. One gets a lovely view of the city from it, but the garden makes nothing of such possibilities and consists only of two long, pleached ilex alleys—one on the main axis of the villa and the other at right angles to it leading from the side of the forecourt. The first alley leads to a circular arrangement of hedges and shrubbery which is a well preserved example of Tuscan bird-trap, while the other leads directly to the theatre. The latter alley paced some three hundred and fifty feet long and is twelve feet wide. At the end one comes out again to the open, while the hedge divides and runs completely around the theatre at a height of fifteen feet. Four steps lead down to the parterre (or rather "parquette" or "pit" would be the proper term for a theatre), which is enclosed on the sides by a smaller ilex hedge. A stone seat runs along below this hedge, while the central part of the pit is laid out in a charming pattern of "broderie" in turf and gravel walks a foot wide. One does not like to imagine that space occupied by stiff rows of seats in anticipation of a performance. Perhaps the audiences were never sufficiently numerous to make it necessary. The plan of the whole is an oval, of which about half is taken up by the stage, which is raised three feet above the level of the pit. Its floor slopes very slightly up toward the back. The front wall of the stage is curved in a charming baroque fashion and is





flanked on either side by cypress hedges which must be considered as forming the sides of an imaginary proscenium arch. Back of these there are three wings and a "back-drop" of cypress hedge twelve feet high. There is a communication completely around the theatre, and the outer ilex hedge is pierced in several places to admit freer entrance and exit. The soft green of the cypress makes an excellent background, which seems continuous for one cannot distinguish the wings unless the sun casts a shadow from one upon the next. The crowning glory of the Villa Gori theatre is undoubtedly the three cypresses which are planted—one directly on the main axis back of the stage and one at either side on the line of the front of the stage. They are very thin and give a curious effect in their contradiction of the low and monotonous lines of the hedges. Outside the ilex hedge are only ploughed fields and orchards, so it is best to retrace one's steps up the long alley—through the opening of which, turning back, one sees the sunlit stage and soft green of the hedges.



In the same direction from Siena but farther out is the Villa Serraglio. It, too, lies on the top of a ridge, but one no longer gets a view of the city. The L-shaped house and terrace complete a rectangle from which a long avenue of cypresses continues along the ridge to a monument of most regrettable nineteenth century taste in honor of some famous member of the family. From this point one descends the wooded hillside by winding paths, meeting at every turn inventions and surprises appropriate to the rustic and informal style of gardening. There are a summer house of bark with a thatched roof, an imitation Etruscan tomb, serpentine lakes with Japanese bridges, broken columns with inscriptions, and other fantasies. Among these is a small theatre with yew hedges. It is about the size of the Villa Gori theatre and might almost have been intended as a play theatre for children, but the gardener said that in years gone by plays had often been given there. The plan is severely utilitarian and has none of the baroque quality of the Villa Gori. One ascends five steps to the "pit" from a curving path with low hedges. The floor is of gravel with eight stone seats arranged two by two, now quite overgrown with ivy. The stage is four feet above the parquet level, and in the middle of the front wall is a semi-circular recess for the

inevitable prompter. The stage is rectangular in plan and is completely enclosed on the sides and back by a yew hedge ten feet high. On the main axis at the back is an opening leading into a semi-circular recess enclosed and covered by clipped yew, which might have concealed a small orchestra. Or was it, perhaps, the green-room? There are four small wings on either side and a long "back-drop." This theatre is the least formal of the four. It is treated merely as an incident, hardly more important than any of the other features scattered about on the hillside.

Outside the historical Porta Camollia of Siena, not far from the well-known Palazzo del Diavolo, is the Villa Sergardi, which has an elaborate and large ilex theatre. It is somewhat larger than the one at Villa Gori. The hedges are much thicker and higher and the stage narrow and deep in comparison. Its effect is rather pompous and heavy as for a theatre of tragedy. It is curiously situated directly opposite the garden façade of the house across a parterre perhaps eighty or a hundred feet wide. The rest of the garden descends in terraces from the parterre on an axis at right angles to that of the house and theatre. Owing to this arrangement there is no place for the pit and one must suppose the audience to occupy the windows of the house. The rise of the stage is concealed by a box hedge four feet high. At either side the entrance to the wings is by a covered alley of ilex, running completely around the theatre. The wings, of which there are four on each side, are six feet thick and eighteen feet high, while the passages between are only three to four feet wide. These, together with the pleached alley, form an apparently solid mass of green. At the back of the stage is a niche cut out of the ilex some twenty feet high, at present containing a large and very poor statue of Bacchus. The topiary work here is more elaborate than in the other theatres; in fact there seems to be a rather unsuccessful striving for effect. Its plan is the least practical of the four. The stage is much too narrow and deep, while the hedges forming the wings fill up all the space which should have been left free for working space.

A few miles outside of Lucca in the direction of Bagni di Lucca lies the Villa of Marlia. The estate originally belonged to a noble family of Lucca, but now it forms part of the royal lands. The gardens have been much changed at various times and now the formal part is quite remote from the house. There is a terrace with a large rectangular pool surrounded by balustrades and with a fountain at either end. At right angles to the long side of the basin, runs a second axis which is terminated by a charming yew theatre. Between the theatre and the large terrace is a "rond-point" in the centre of which is a magnificent jet of water, which, unfortunately, spouts much too high for the size of its pool. Seven steps ascend from here to the level of the "pit" of the theatre. This semi-circular space, covered with turf, is surrounded by a terrace nine feet wide raised about three feet above it. The terrace steps down forming two rows of seats in the manner of a Greek theatre. Enclosing the pit is a yew hedge sixteen feet high through which one passes into a covered walk communicating with the space back of the wings. The stage is large with a sloping turf floor. There are the usual four wings on each side and a sort of triple "back-drop" with a niche for a statue cut in the middle. The theatre was evidently cut from the side of a hill, for immediately back of the stage is a retaining wall some twenty feet high, and one sees some magnificent pine-trees towering above the hedges. In front of the stage is a chair cut out of yew as for the director of an orchestra and also a little yew hood for the prompter. This theatre is the most practical of all as regards seating space for the audience. The stage also is wide and not very deep and there is admirable working space outside the wings.

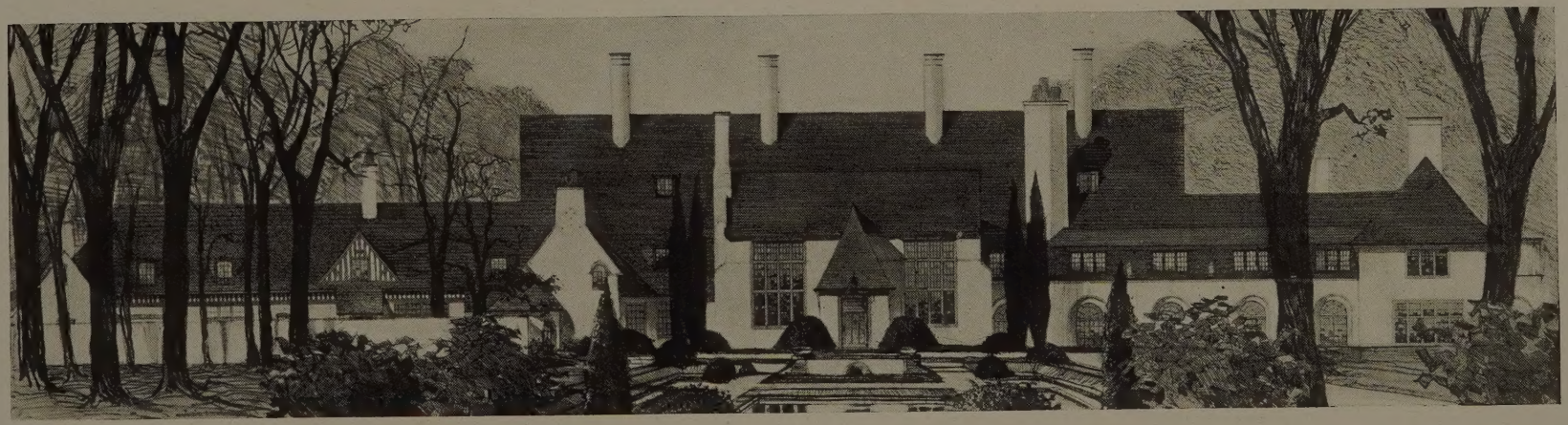
In these four theatres the type of the "teatro di verdura" seems to be well established. They vary only in minor details. Aside from any possible usefulness they serve admirably as garden architecture to terminate a vista, for they give a spot of interest which, while it may lack the variety of an arrangement with water, presents a vivid picture to the imagination. As one comes out of the shade of the long alley at the Villa Gori it is not hard to picture Pavlowa dancing on the smooth sand of the stage. At Marlia the short turf sprinkled with cyclamen and daisies just as one sees the ground in Botticelli's "Spring," makes one think of the frivolous diversions of a gay Decameronesque company. And in these days of simplified stage-setting, what could be more admirable than the even and monotonous green background which serves the imagination equally for forest or palace?

The possibility of the introduction of such a feature in an American garden is fraught with the difficulties of our climate. The nervous strain of hoping for good weather for an out-of-door performance exhausts both audience and players long before the appointed day. Besides, there is the initial difficulty in our climate—speaking for New England—of finding the growth suitable for hedges. It does not, however, seem entirely impossible; the native juniper or the hemlock may be used, although difficult to train, and there are still more possibilities in deciduous growths, for our gardens are only practicable during the summer months. One can imagine a summer garden-stage where a Ben Greet performance might meet with greater success than amongst the usual collection of brush and propped-up fir-trees which constitute our temporary out-of-doors theatres.

The Illinois Architects' Licensing Law

ACCORDING to a recent report presented by Francis M. Barton, secretary of the Board of Examiners of Architects of Illinois, the working of the Architects' licensing law in that State has involved the readjustment of certain ideas as to the relation of other professions allied to the practice of architecture. The report sets forth that the legality of the board's interpretation of the act constituting the department has been fully sustained by the Supreme Court. Continuing, the report states: "This board has found its greatest work to be the elimination from the architectural field of various architectural firms, which operate under an alias, such as architectural engineers, civil engineers, industrial engineers, designers, builders, etc. Most of these violations are assisted by a licensed Architect, who is either financially interested, a partner, or who secures a salary. This board has eliminated at least twenty such illegal combinations in the last few months, and expects to eliminate all others from the architectural field in the near future. These combinations are to a great extent the result of lack of enforcement of the law or improper interpretations of the meaning of the wording of the act. Attention is called to the fact that all structural engineering on building is part of the Architect's work and cannot be performed by others, except under the direction of a licensed Architect; and that the Architect is responsible for all engineering data shown on his sealed plans, whether performed by him or not."

South Front.



North Front.

PRELIMINARY STUDIES, COUNTRY HOUSE, SETH E. THOMAS, MORRISTOWN, N. J.

Harrie T. Lindeberg, Architect.

I. Planning the Specification

By Frederich N. Reed.

Mr. Reed has made a study of the art of specification writing and is often called upon by the more prominent New York Architects to specify their most important work.

THE Architect presents his conceptions to the contractor for estimate in the form of drawings and specifications and, if the drawings may be likened to his right arm, the specifications are certainly his left. In nine cases out of ten, his right has a much stronger punch than his left, and the reasons are not far to seek.

First.—Even though the technique of the draftsman be an artistic matter, the general scheme of presenting a building in plan, elevation and section is based on an exact science—orthographic projection. Excellent courses and text books on this subject are available; the failure to make one's elevation agree with the plan is as much a mistake as the incorrect addition of a column of figures which anyone familiar with the subject is competent to point out. Specification writing, on the other hand, is literature, however humble; it is certainly not an exact science.

Second.—Through competitions, exhibitions and the publication of working drawings in the professional magazines, there is a constant interchange of ideas among draftsmen, so that standards are insensibly formed by which their work may be judged. But the student of specification writing has no such resource. Certainly, no one ever thought of publishing a specification; and, in a large office, he may even find access to the file rather difficult. The best critics of specifications are the contractors and, particularly, the contractors' estimators; but the relations between architect and contractor prevent the latter from volunteering criticisms. The average architect appears to be satisfied if the list of extras be kept fairly low; and though he may, at huge pains, elaborate his drawings far beyond the point necessary to produce this result, he seldom thinks of expending anything like the same effort on his specifications, or seems to realize that there is any standard other than the avoidance of extras. Most treatises on the subject, and the courses offered in our technical schools, seem to be based on the theory that a good specification may be produced by anyone who has studied the working processes of the various trades. Unfortunately, however, something more than this is necessary, and this article has been written to give the reader at least an idea of what that "something" is.

The presentation of this phase of specification writing is a difficult matter: it is so seldom treated that there are actually no recognized English words by which some of the concepts may be expressed. The method that I have adopted, that of describing the writing of a specification in a large metropolitan office, has the merit of being at least understandable, and it enables me to take up each point as it occurs in actual practice, adding my own suggestions.

A new job is generally announced by a conference with one of the firm or with a leading inside man who has been in charge of the drawings and who is familiar with the selection of materials, this matter being usually settled before the job goes into the specification room. Sometimes the specification writer makes his own notes at the conference, and sometimes he receives notes that have been made by others.

His first task is to display his prints in a systematic manner. All of the plans, for instance, may be placed on one wall of the specification room and the elevations and sections on the other. Each group should be carefully lined-up, since the prints that are sent to the specification room are often made before the cloth drawings are entirely finished. A careful lining-up of the prints may direct the specification writer's attention to the fact that a certain wing roof has not yet appeared upon the proper plan, in which case it may be roughly outlined in red or yellow pencil. Both plans and elevations should be placed in logical sequence, so that any feature may be readily followed from one drawing to another. Draftsmen generally use much larger sheets than are necessary; and this superfluous paper must be folded back or trimmed off in order to economize space and bring the entire group within the compass of a single glance. All of these things take time, but in the long run, they save time.

From his first glimpse of the prints, the specification writer begins the most important part of his work—visualizing the building. Too much emphasis cannot be placed upon this, since a man whose conception of the building is at all vague or cloudy can never produce a clear specification. The visualization cannot, of course, be instantaneous; it must be built up little by little, but the more rapidly the better. By the time actual writing is in progress, it should be definite enough to enable the specification writer to take an imaginary trip through the building and be absolutely sure at every point, not only of the materials that would be in plain sight, but of the construction concealed behind them.

The second stage is scheming out the framework of the specifications. This outlining of the arrangement that is to be followed throughout the entire work is a difficult matter in some forms of literary composition, but in specification writing it is easy, if (and the "if" is important) the underlying principles are once firmly grasped.

Now, specifications are not written for the general public, and it will be of great assistance in the subsequent work if we first fix clearly upon the person for whom they are primarily written. It must be either the owner, architect or contractor, but as the last two act in a sort of dual capacity, the number may be considered as increased to five—owner, architect's draftsman, architect's superintendent, contractor's estimator and contractor's superintendent. So far as the owner is concerned, the case of the specifications offers a close parallel to that of the drawings which are prepared for final estimate in the form of geometric projections which may be more or less unintelligible to him—a tacit recognition of the fact that his interests are best served when the building he desires is presented, in the form most convenient to them, to those who are to build it.

The case of the draftsman and the two superintendents is alike in this, that they all have ample time in which to accustom themselves to any arrangement. This leaves only the contractor's estimator, who is in a class by himself, being obliged to put, in a very short time, a price on work with which he has had no previous acquaintance.

Now, it would be possible to write specifications by taking

(*Continued page 79*)

HAMPTON SHOPS, 18-20 EAST 50TH ST., NEW YORK.
W. L. Rouse & L. A. Goldstone and J. L. Steinam, Architects.

(*Continued from page 77*)

up the different parts of the building in order, specifying each from start to finish. For instance, in domestic work, we might take up, say, the porch, beginning with its foundations, then going on to the columns, then to the framing and finish of the entablature, then to the slate roof, ending with the painting, and then taking up some other part of the building in the same way. This arrangement would be more convenient than the other for the owner, the draftsman and the two superintendents, but it is open to the insuperable objection that the various trades could never find what they needed for estimating purposes and, what is even more important, they could never be sure that they had found it all. These considerations enable us to fix finally upon the *estimator* as the person for whom primarily the specifications are to be written.

The arrangement most convenient for the estimator, and for the letting of the necessary sub-contracts, is one that conforms to the organization of the building trades in the locality in which the building is to be built. We recognize this fact when we divide even the simplest country specification into masonry, carpentry and painting sections, and we cannot escape the same conclusion on the most complicated work in large cities, even though from twenty to twenty-five sections be required.

Emerson said, "Hitch your chariot to a star," and it should be the aim of the specification writer so to arrange his work that the successful bidder will let each section as a separate sub-contract just as it is written, without having to ask any sub-contractor to omit or to add a single item. Since general contractors, in handling a given job, differ considerably in the number and scope of the sub-contracts that they make, this would, at first glance, appear to be an impossible feat; but the perplexed specification writer can always remember that while it is comparatively easy to scramble eggs, it is pretty hard to unscramble them.

The moral of this is: "Make a separate section of the work of each trade that *any* general contractor may wish to let as a separate sub-contract". Those who are less thrifty can easily ask any sub to include two or more sections, while the more thrifty or those knowing of small firms who confine themselves to a single trade and who figure low, will appreciate the finer sub-division.

Incidentally, it is to the advantage of the architect to assist those general contractors who desire to deal directly with as many trades as possible; first, because what may be called "sub-sub-contractors" seldom come up to the standard of those having their contracts directly with the general contractor, and in the execution of the work, they must be reached by roundabout means at a great loss in efficiency; second, because an additional profit is always added with each sub-letting and Architects who remember this can always build more economically than those who do not.

It must be noted in this connection that the work of any trade may carry so little value that all general contractors would let it through a related trade to save the expense of administering it separately. Trades may generally be considered as "related" if one has jurisdiction over the setting of material that is manufactured by the other, or if their working processes are similar. The latter statement, however, is subject to the important exception that, though the working processes of the sheet metal workers could hardly be more unlike those of the trade having jurisdiction over tar and felt, the two trades are, nevertheless, very closely related.

To arrange a specification so as to facilitate the estimating and sub-letting demands a thorough knowledge of trade jurisdictions; and, unfortunately, there is seldom any one source from which this information may be obtained. Then, too, jurisdictional fights sometimes occur among the trades, particularly over new materials and methods of construction, so that the jurisdictions cannot be considered permanent.

My usual method is to run through a list of all the recognized trades, cross off those having no work in the building, and then indicate in some way the disposition that is to be made of those having but little. The remaining trade names form the skeleton of the specifications. Though the number of possible section titles is, in New York City, between forty and fifty, the actual number of sections will seldom exceed twenty, for the reasons just given.

Before starting on the actual writing, provision must be made for the classification of all available information. For this purpose the best form that I know was devised by Mr. E. E. Hendrickson of Philadelphia. It is made by pasting together sheets that have been torn from a small pad, in such a way that they overlap like shingles laid half an inch to weather. This was called by its originator a "snake" on account of its sinuous appearance when made up for a long specification. The snake is used upside down, as if the shingling began at the top. Any form, however, will answer that includes a blank page for each section, with projecting tabs for their titles. The use of this will be explained later, but the form must be made up as soon as the skeleton of the specifications has been determined, a section title placed upon each tab, and all the information that was obtained at the conference written-in, carefully classified according to trades.

The specification writer is now in the position occupied by the White Rabbit at the trial in "Alice in Wonderland," when he asks, "Where shall I begin, please Your Majesty?" The usual plan of procedure is expressed by the king's reply, "Begin at the beginning and go on till you come to the end: then stop." The objection to using this method here is that the building must be completely visualized before one can "begin at the beginning." A far better working principle has been so neatly stated by Kipling that I cannot resist quoting it.

> "But the things you will learn from the Yellow an' Brown,
> They'll 'elp you an 'eap with the White!"

That is to say that the sections first written should be those that will be of the greatest assistance in visualizing the work to be described in those that remain. The principle, however, demands a further explanation. Some of the trades may be considered as finishing trades pure and simple, while the work of others consists wholly or in part of items that are designed as a foundation for work that is to follow. Now, it is much easier to visualize the apparent finish than the concealed construction; and the labors of the specification writer will be greatly lightened if the finishing trades be written first. For instance, after having written the tiling, one's mind naturally drifts to the cement plastering and cinder concrete fill that it requires; and the necessary notes must at once be made in the snake, under the proper headings, for elaboration later.

The first group of sections to be written should comprise those trades that can, in no sense, be considered as preparatory, such as the tiling, interior marble, cut stone and sheet metal work. Also included in this group should be the plumbing, steamfitting, electrical work and mechanical equipment, since they frequently require the co-operation of other trades. If consulting engineers have been employed on any of these, they should be asked to furnish lists of the work required by other trades; and the telephone company should be consulted in regard to the telephone installation. When this first group is complete, the pages in the snake corresponding to the remaining trades should be fairly well filled with notes.

(*To be continued*)

Detail.

Foyer Hall.

HAMPTON SHOPS, 18-20 EAST 50TH ST., NEW YORK.

W. L. Rouse & L. A. Goldstone and J. L. Steinam, Architects.

II. Heating Problems for Architects

By DeWitt Clinton Pond, M. A.

Mr. Pond has charge of the practical course in Architectural Engineering at Columbia University. He is the author of "Engineering for Architects," recently published in book form, the same being a series of articles formerly appearing in ARCHITECTURE.

THE fault that can be found with many of our engineering formulas is that they are not absolutely founded upon facts that are known to exist in all cases where the formulas are used. The problems found in properly heating a building call for so many assumptions that formulas often vary and the constants that are used are often given different values by different engineers. In the last article a formula was given by means of which it is possible to determine the quantity of heat lost through the walls and windows of a room. This formula is Q=AKT, and Q is the quantity measured in British Thermal Units,—B. T. U.—A is the area of the surface through which the heat escapes, and K, and T represent the constant and the temperature difference.

K is given a different value in nearly every table and represents the number of B. T. U. that escape in an hour through a square foot of surface. Naturally the value for K varies for different kinds of surfaces, but the different engineers have not entirely agreed as to the value even for the same kind. As an example it will be found that the number of B. T. U. lost through windows was given in the last article as 1.22 per square foot per hour. The value given in the catalog of a well known heating concern is 1.10. It depends largely upon the opinion of the engineer as to which is right. In the opinion of the author the higher value is more correct although it gives a larger value for K than is usually accepted. In the same manner it will be found that the value for K for walls of a frame house may seem high, but the tabulated value of .33 has been found to give satisfactory results. In any case the engineer will find constants that he himself will use, and those given and used in these articles are to be accepted only after he is convinced of their practical value.

Once it has been determined that a certain number of heat units are lost through the walls and windows of a room, the problem arises as to how to supply the necessary quantity of heat to make up this loss.

The old and simple way was to build a fire in each room and before the days of stoves and fireplaces the dwellers in the early mediaeval castles reduced simplicity to its lowest terms and built fires in the middle of the great halls and allowed the smoke to escape through a hole in the roof. Today, however, instead of having as many fires as there are rooms to be heated, we demand that all rooms be heated from one central source. The problem then arises as to how to convey the heat from the central source to each room.

There are three mediums by means of which this is done, —air, water and steam. The medium of air is made use of if furnace heat is desired. This method of heating has one great advantage and that is that most furnace systems are inexpensive to install. There are other advantages which a carefully designed hot air system has, such as a combination of fresh air supply with heat supply, and general simplicity of construction and operation. There are many who prefer the furnace system simply because of these last two reasons.

A single pipe steam system is the next most expensive to install but this has many advantages and, in fact, is the only system that is practicable for certain uses. Apartment house installations are largely of this type. This system combines the advantages of comparatively low first cost and a reasonable up-keep.

The most expensive system to install is the hot water system, but the low cost of up-keep for a well designed installation and the fact that water may be heated to either a low or high temperature and is easily controllable from the generator makes this type of heating very popular. The reason that the cost is high is because the hot water system requires return piping and large radiators.

A furnace system depends upon the expansion of heated air to cause circulation in the system. This expansion in reality causes only a slight "head" and for this reason a hot air system has to be given the best conditions in which to operate. The indirect systems in which air is *forced* over hot water or steam pipes give the advantage of ventilation plus heat, but these systems are usually only used in buildings such as schools or places of public assembly where ventilation if of the first importance. These systems are both expensive to install and to maintain.

The furnace system might be called a *kind* of indirect system as the air is circulated through the cold air intake, over or around the radiator through which the hot gases of combustion must pass before going up the chimney flue, and after the air comes in contact with the radiator it expands and is carried up, through the different ducts, to the different rooms. In this type of heating there is nothing *positive,* however. In the properly called "indirect system" the air is given a positive force by means of sending it through fans or blowers, and a heating engineer can determine very accurately the amount of heat and ventilation that can be furnished to a room, or a number of rooms, by means of this.

A furnace is nothing more or less than a stove with a sheet metal case around it. The only addition that is made to the ordinary stove is a member called a *radiator.* This is in reality only an extra twist to the smoke outlet which is placed in such a position that, instead of allowing the hot gases of combustion to pass directly to the smoke flue in the chimney, they are forced to pass through the radiator first. The entire furnace is surrounded by the sheet metal case and fresh air is admitted at the bottom of this. This air comes in contact with the heated surfaces of the furnaces, the fire pot, combustion chamber and then the radiator. It is the object of the designer of a furnace to furnish as much hot surface as possible for the air to come in contact with and the radiators are now designed in such a manner as to cause the hot gases of combustion to give off most of their heat before passing up the chimney.

There are several things for the architect, heating engineer or owner to observe about any furnace. The amount of radiating surface supplied to heat the in-coming air is the most important. The kind of grate, construction of the fire pot, size of the combustion chamber, and pattern and construction of the radiator, are all things to be noted. The grates should be of the triangular revolving type, the fire pot should be of heavy cast iron construction and lined with firebrick, the dome, or combustion chamber, should be large enough to allow a

thorough combustion of the gases, and the radiator should be constructed so that the soot shall not collect on the bottom but will fall back into the combustion chamber. If soot is allowed to collect in the radiator the surfaces on which it is found become practically worthless for the purposes of heating the air.

The problem that confronts the architect is that of solving the question of the size of the generator and the proper proportions of the ducts.

As was said at the beginning of this article there is no formula that can be said to be absolutely correct or any method that is the best for the solving of heating problems. The fact that a strong wind may change the direction of the currents

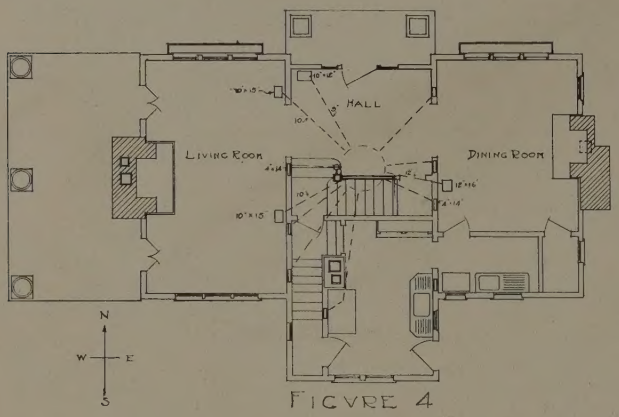


FIGURE 4

of hot air makes the most careful calculations almost worthless at times. On the other hand, the fresh air intake is always placed on the side of the house facing the strongest winds, and this arrangement causes a greater supply of fresh air on the days when the wind is the strongest, but causes the velocity of the hot air to change so that calculations do not always give the desirable results. To arrive at some results it is always necessary to assume a constant velocity of incoming air, a constant temperature of air supplied to the various rooms, and a constant efficiency of the heater and any one of these three considerations may vary. For all the above reasons calculations for hot air furnace systems cannot be said to be positive even at best.

In the last article it was shown how to determine the heat lost through the walls and windows of a house or a single room. In Fig. 4 is shown a plan of a small country house and it will be noted that the living room is twenty feet long and twelve feet wide, and that there are three windows in each of the north and south walls, each three by five feet. There are two casement windows in the west wall. These are three feet by seven feet. By the methods given in the last article it is quite possible to determine the quantity of heat lost through the walls and windows of this room. The north wall is twelve feet long, and as the height of the first story from finished floor to finished floor is eight feet and three inches, there are $12 \times 8.25 = 99$ square feet of wall surface in this wall. The windows have a combined area of 45 square feet so the net wall area is $99 - 45 = 54$ square feet. The number of B. T. U. lost through the walls of a frame house per hour is taken as .33, and the number lost through the windows is taken as 1.22. We then have, considering the temperature difference as 70 degrees:

$$45 \times 1.22 \times 70 = 3{,}843 \text{ B. T. U.}$$
$$+54 \times .33 \times 70 = 1{,}247 \text{ B. T. U.}$$
$$\text{Total} = 5{,}090$$

The total number of heat units lost through the north wall is then 5,090 and the same number is lost through the south wall as the two are exactly alike. There must be a correction made for the north wall, as all northern exposures have an addition of thirty per cent. made for this exposure. The total number lost, therefore, will be $5{,}090 \times 1.30 = 6{,}617$ B. T. U.

The west wall has a length of twenty feet and a height of eight feet and three inches. The gross area will be $20 \times 8.25 = 165.0$ square feet. The window area will be $2 \times 3 \times 7 = 42$ square feet. The net wall area, therefore, will be $165 - 42 = 123$ square feet.

$$42 \times 1.22 \times 70 = 3{,}586 \text{ B. T. U.}$$
$$+123 \times .33 \times 70 = 2{,}841 \text{ B. T. U.}$$
$$\text{Total} \quad 6{,}427 \text{ B. T. U.}$$

The correction for the west wall will be an addition of twenty-five per cent. $6{,}427 \times 1.25 = 8{,}033$, and this added to the B. T. U. lost through the other walls will give the total for the room. $5{,}090 + 6{,}617 + 8{,}033 = 20{,}740$ B. T. U. This loss must be made up by the heat poured into the room through the hot air registers.

The temperature of the in-coming air can be considered as 130 degrees and of this 70 degrees is at the same heat level as that of the room. The remaining 60 degrees is used to offset the loss of 20,000 B. T. U. As about one-half the temperature is useless as far as counteracting the loss through the walls, it will be necessary to supply more than twice as many B. T. U. to the in-coming air as are lost. In other words, the number of B. T. U. brought into the room by means of the hot air must be $130/60 \times 20{,}000 = 43{,}400$. It has been determined that one cubic foot of air can supply 2.2 B. T. U. in cooling from 130 degrees to zero, so that the total number of cubic feet of air to supply 43,300 B. T. U. will be $43{,}300 \div 2.2 = 19{,}700$ cubic feet, per hour, that will be required to offset the loss of heat. If this is divided by 60 the number of cubic feet per minute will be given, or, $19{,}700 \div 60 = 330$ cubic feet.

In a room of the size shown on the plan it is advisable to have two registers and the number of cubic feet per register will be $330 \div 2 = 165$ cubic feet.

It has been determined that the velocity of hot air rising from a furnace will be 260 feet per minute at the first floor and 380 feet per minute at the second floor. If the number of cubic feet necessary is divided by the velocity of the air the cross sectional area of the column of air that is passing through the registers will be given. In other words, 165 cu. ft. divided by 260 feet will give .63 sq. ft. as the area of the supply duct. From the table given in Fig. 5 it can be seen that the choice lies between a ten and twelve inch circular duct, and the register that will be selected will be a 10×15-inch register.

The front hall, with the exposed wall on the north side, will have a heat loss of 6,500 B. T. U. and this will call for approximately 6,400 cubic feet of air, per hour. $6{,}400 \div 60 =$

DUCT AND REGISTER SIZES

DIAM. OF PIPE	AREA IN SQ. IN.	AREA IN SQ. FT.	REGISTER
8	50	.349	8×12
9	63	.442	10×12
10	78	.554	10×14
12	113	.785	12×16
14	154	1.07	14×20
16	201	1.40	18×20

FIGURE 5

107 cubic feet per minute. If the velocity is 260 feet per minute the area of the duct must be $107 \div 260 = .40$ square feet, and, referring to the table it will be seen that a nine-inch circular duct will have this area and will require a $10'' \times 12''$ register.

(Continued page 87)

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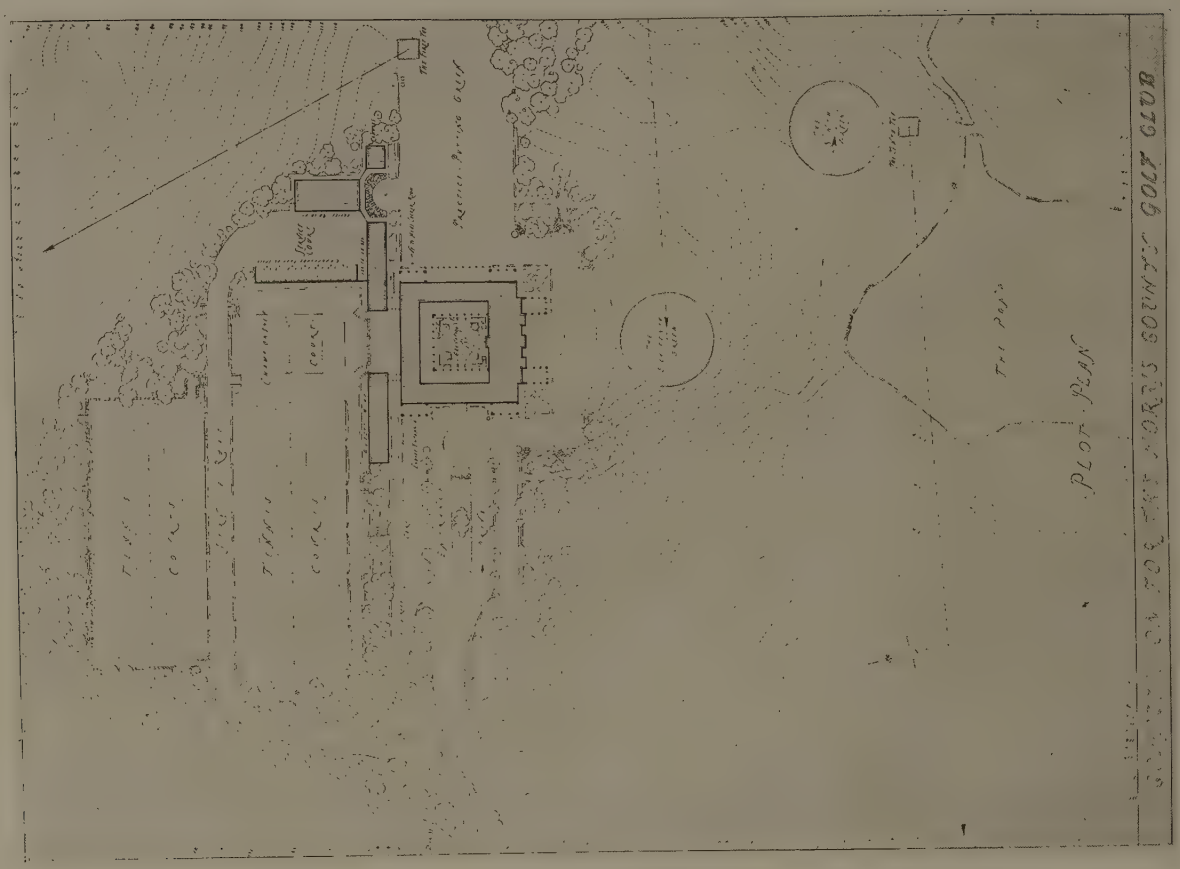

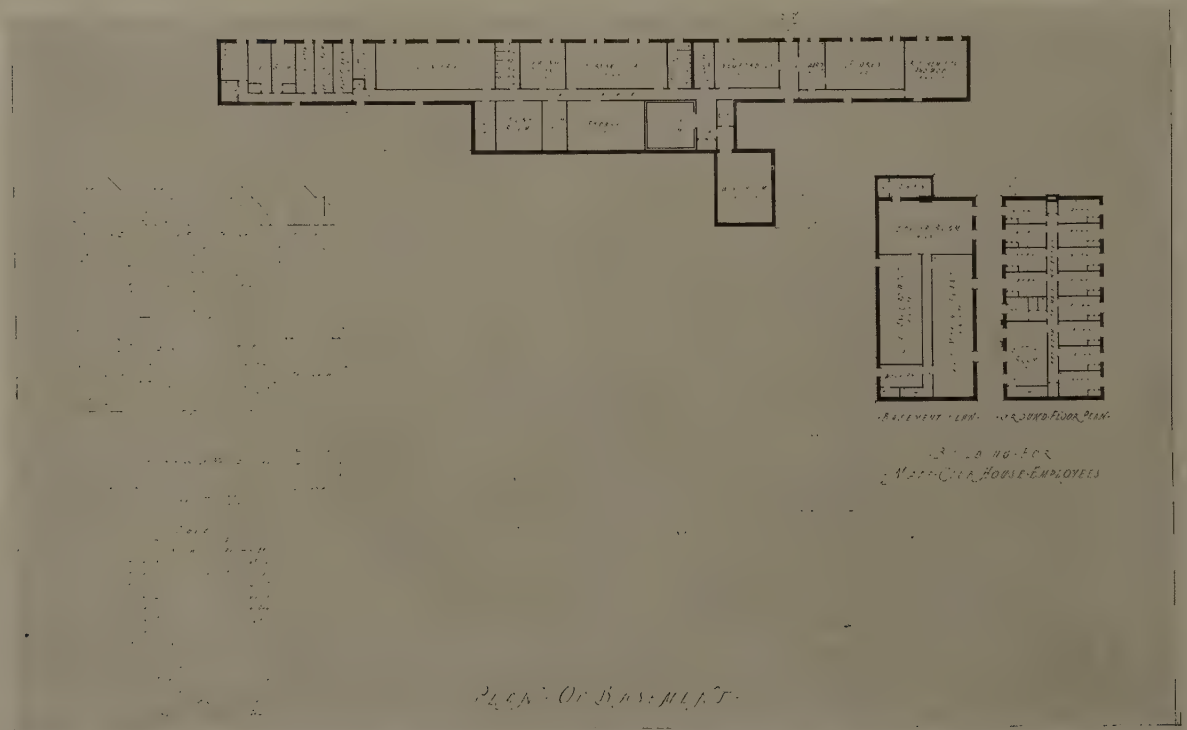

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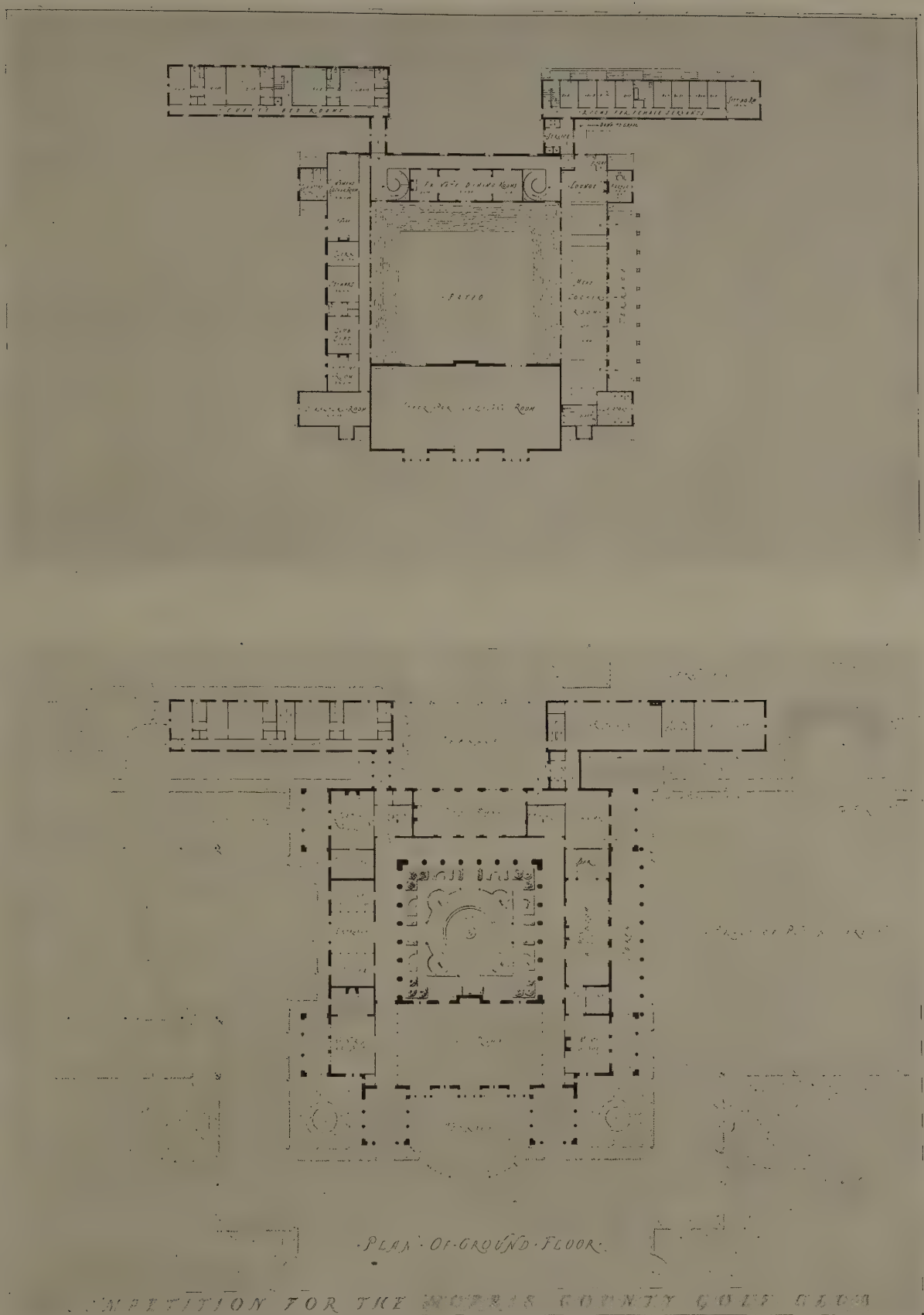

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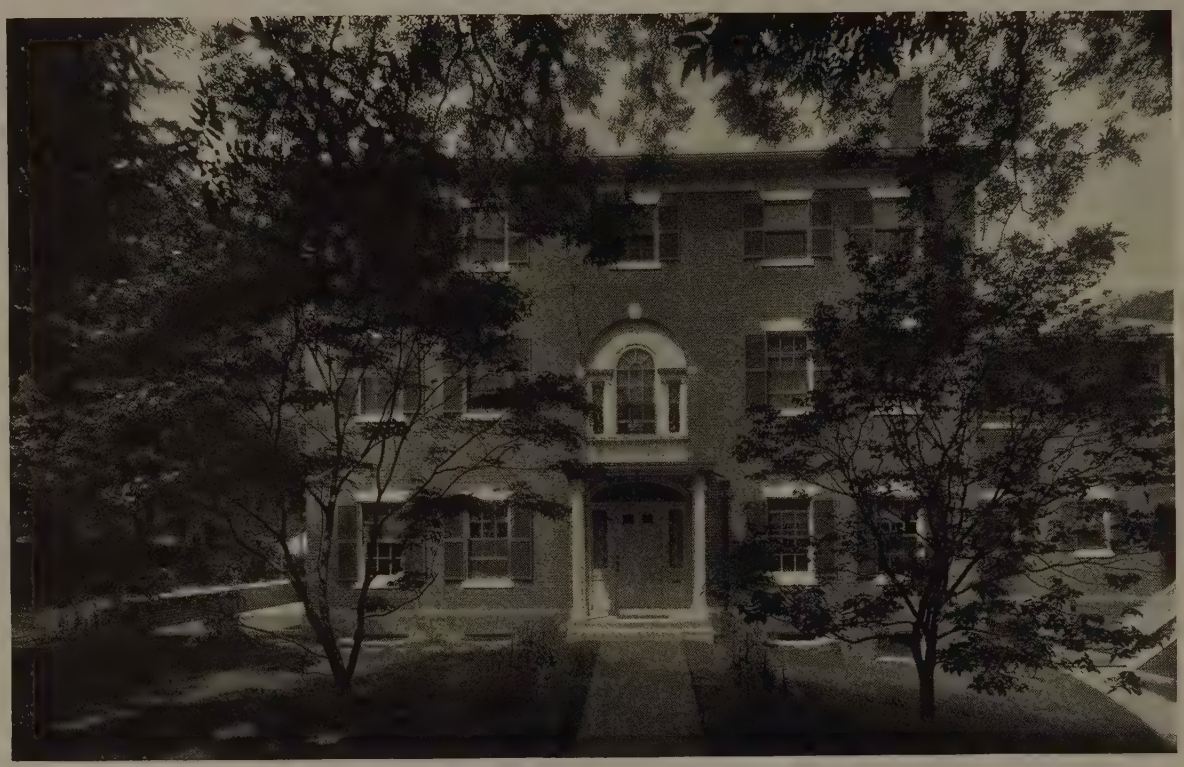

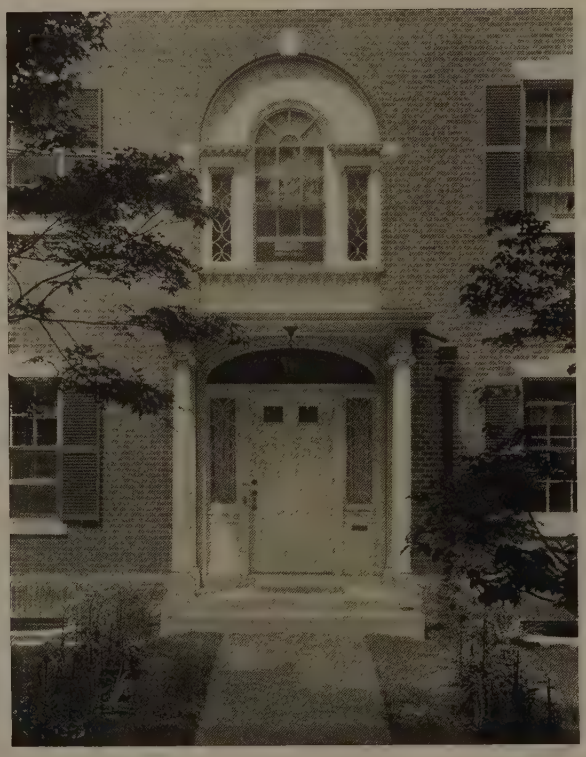

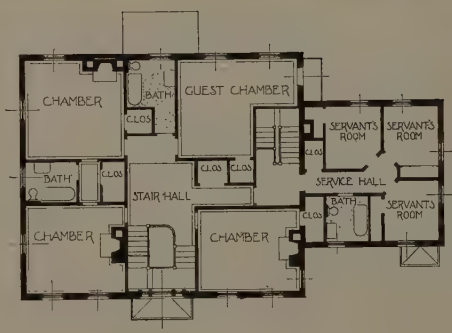

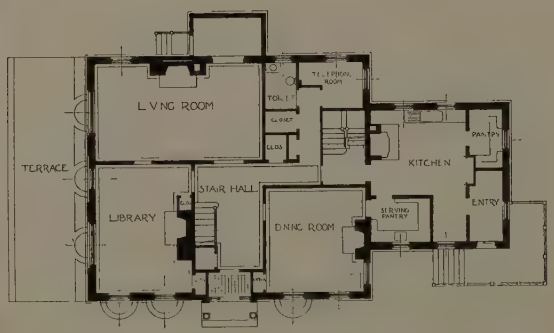

HOUSE AND PLANS, HENRY D. BENNETT, BROOKLINE, MASS. Kilham & Hopkins, Architects.

(*Continued from page 82*)

In the living room there will be two 10″ × 15″ registers and in the hall a 10″ × 12″ register. It will be found necessary to have a twelve-inch duct leading to the dining room and a 12″ × 16″ register in this room.

A bedroom on the second floor will have a heat loss of 11,000 B. T. U. and this will mean that the number of cubic feet of air that must be supplied will be 10,830. Divide this by 60 and again by 360—as the velocity of air to the second story is 360 feet per minute—and the resulting area of the duct for this room will be found to be .50 square feet. A duct measuring 4″ × 16″ will be of sufficient size. Unfortunately, most studs are 2″ × 4″ spaced 16″ on centre and this means that if a duct is to be run up in a stud partition it will be necessary at times to confine it to the size of 2″ × 14″ whether this will be enough or not. This is one of the difficulties of designing a hot air furnace system for a frame house.

After all the duct sizes have been determined it is possible to determine the size of the fresh air inlet. The area of this should be about three quarters of the combined area of all hot air ducts. If this rule is not conformed with the supply of hot air to all registers will be interfered with seriously.

Some heating contractors determine the size of their heaters by means of the combined areas of the hot air ducts. In the catalogs of the manufacturers furnaces are rated according to grate areas and also according to the hot air duct capacity. It can be found that the house in the problem will need a hot air duct area of 700 square feet. In a manufacturers' catalog it will be found that a heater having a capacity to this will have a grate that is 27 inches in diameter.

Another method of determining the size of the heater is to determine the total number of B. T. U. necessary to supply that heat lost throughout the entire house. Suppose in the above problem it was 90,000 B. T. U. The number of B. T. U. that would have to be supplied to the in-coming air would be 130/60 × 90,000 = 195,000 B. T. U. The number of B. T. U. given off by one pound of coal in one hour is 9,000, so the number of pounds of coal that will be necessary will be 195,000 ÷ 9,000 = 21.7. If six pounds of coal can be burned on one square foot of grate per hour, the number of square feet of grate can be found by dividing 21.7 by 6 and this gives 3.6 square feet. The diameter of a grate having this area can be found to be 26 inches, and the nearest commercial size will be a 27-inch grate as found above. In both cases—from the combined duct area and the number of B. T. U. necessary—the commercial size of grate will be larger than necessary.

By means of the information given in this article it is possible to find the sizes of ducts, registers, inlets and grates necessary for a complete hot air system. The sizes found above may be considered liberal, but it would be hard to guarantee a system that had smaller sizes than those already found. It is safe to say that a contractor would determine sizes about 5 per cent. smaller throughout, but it is also safe to say that the system so laid out would give the same kind of satisfaction as 95 per cent. of the hot air systems now in existence.

Legal Decisions of Interest to the Architect

These decisions appear monthly and are edited by Mr. John Simpson, the well-known lawyer.

Construction of Arbitration Clauses in Building Contracts.

Contractors did construction work for an owner under an agreement that the engineer in charge should have "the final decision of all matters in dispute involving the character or amount of work and the compensation to be made therefor, or any questions arising under the specifications. In an action on the contract, the plaintiffs at the trial offered evidence to show that the engineer had made deductions against them because of defective construction due to errors committed by the defendant in excavating for the foundation; that the defendant had destroyed some of the plaintiff's forms for pouring concrete, for which no compensation had been made; that the plaintiff suffered loss, not compensated for, by reason of incorrect lines given by the engineer, and that through the defendant's negligence the plaintiffs were compelled to take up and clean pipes without reimbursement. The offers were objected to, and the testimony was excluded by the trial court as relating to matters falling within the power of arbitration conferred upon by the engineer. Dissatisfied with the amount of a verdict in their favor, plaintiffs applied for a new trial. The Pennsylvania District Court held that the stipulation in the contract that the engineer's decision should be final must be restricted to matters arising out of the plaintiff's undertaking in the contract and the duties to be performed by them under it, and that he was entitled to decide the matters covered by the offers of evidence. The Court held that the agreement fell within the principle applied in the recent cases of Miller *v.* Homeopathic Hospital, 243 Pa. 502, and Reilly *v.* Rodef Sholem Corporation, 243 Pa. 528, and in prior Pennsylvania cases, that ordinarily in building contracts the arbitration clauses are to be understood as referring to questions between the contractors and the owners, and not to such as concern the performance of duties by the architects or engineers themselves, who are made the arbiters, and a loss resulting from whose mistakes cannot be visited upon the contractor a new trial was therefore granted.—Bratton Co. *v.* State Asylum, 24 Pa. Dist. 79.

Architect's Certificate Must Conform to Contract.

In an action for damages for breach of a building contract and to recover compensation for extra work, it appeared that the owner had discharged the contractor, taken over the building and completed the work. The contract provided that in such case the expense account incurred by the owner either for furnishing materials or finishing the work, and any damage incurred through default of the contractor, should be audited by the architect, whose certificate therefor should be conclusive on the parties. The architect gave a certificate of the correctness of the expense account of the whole contract, from beginning to end. It was held that this did not comply with the contract. There was no way to determine from it what the owner's expense of completing the work had been, and it was therefore not conclusive on the parties.

One article provided for arbitrating differences concerning allowances to be made either party growing out of alterations in the work where the parties could not agree. Another provided for arbitration as to differences as to extension of time for completion, another as to loss by delay, and another provided the arbitration procedure. But there was no provision for arbitration of differences growing out of disputes as to the balance due by either party or final settlement not involving any of these matters. It was therefore held that arbitration was not a condition precedent to an action. The judgment

(*Continued page 89*)

HOUSE AND PLANS, HOUSTON LOWE, DAYTON, OHIO. Frank Hill Smith, Architect.

(*Continued from page 87*)

for the defendant on a directed verdict was reversed and a new trial ordered.—Stewart *v.* Lafayette, Oklahoma Supreme Court, 153 Pac. 847.

Liability for Insufficiency of Roof.

Architects were employed to draw the plans for a schoolhouse, which they did, and the schoolhouse was completed in conformity therewith. Soon after, the upper story collapsed under the weight of snow which had accumulated on the roof, and the school district sued the architects, alleging that the collapse was due to faulty plans. The only particular in which it was alleged the construction was faulty was that the roof was insufficiently braced. It was an ordinary hip roof, covering a structure 83 feet by 32 feet, with gables approximately 30 feet wide at the centre, both front and back, and at the intersection of the ridge boards of the main roof and of the gables was a belfry. The evidence of inferior construction was that an insufficient number of collar beams had been used on the rafters, thus allowing the roof to spread apart under the weight of snow and push out the side walls. On behalf of the defendants it was shown that the district knew that the roof was not provided with collar beams and that they should have known that the lack of these rendered it unsafe, but that this was not called to the attention of the defendants. It was held that, the architect having been paid for and having superintended the construction of the building and certified it completed in accordance with the plans, the directors of the district might rely on the efficiency of the construction, although they might have discovered what seemed to be a defect, and notwithstanding their knowledge that the roof was spreading and their failure to take any steps to remove the snow from the roof. The architects' negligence depended upon whether the roof collapsed under a load of snow which they might have anticipated. It was held that a depth of nine inches on the roof was not greater than they should have anticipated at Cedar Falls, Washington, and provided against in planning the roof. The measure of damages was held to be the amount of loss actually resulting from the breach of the defendants' contract to furnish plans for and approve the construction of a building which would meet the conditions expected of it. The only testimony as to damages sustained was that of a witness for the plaintiffs that it would cost $900 to reconstruct the second story, $300 to erect a temporary roof such as the plaintiffs had erected, and $320 to repair the damages to the lower story. An award of $1,100 was sustained. School Dist., No. 172 *v.* Josenhaus, Washington Supreme Court, 153 Pac. 326.

Construction of Public Buildings—Compensation of Architect.

Arizona Civ. Code, 1901, par. 3560, provides that the board of supervisors shall secure plans and specifications for county buildings and advertise for same, stating the amount of premium to be awarded to the architect. Paragraph 3561 provides that before the award of a premium to the architect shall be made the board shall require of him a bond upon certain conditions. Paragraph 3562 provides that all contracts entered into in violation of the last section are null and void. In action by a taxpayer against the board of supervisors it is held that the payment to the architect of the premium before requiring a bond of him is a mere irregularity insufficient to show a payment in violation of law, so that the taxpayer cannot recover therefor. Webster *v.* Parks, Arizona Supreme Court, 153 Pac. 455.

Substantial Performance—Remodeling House.

In an action to recover a balance alleged to be due upon a contract for remodeling and rebuilding an old house, many items were embraced in the undertaking and there was sufficient evidence, although contradicted, to show an honest effort substantially to perform the matters required by the contract and the new features which developed as the work progressed. It was held that it was for the jury to say whether there had been substantial performance. The court said that the very many difficulties encountered in rebuilding an old house, changing rooms, enlarging, etc., made it almost impossible to determine in the beginning what would be required and inevitably some defects in construction would appear. Beyer v. Mountz, 60 Pennsylvania Superior Court 22.

Mechanics Lien—Paying Laborers Furnished.

A decorator contracted with an owner to decorate his residence. Being without capital, he contracted with a wall paper company to supply him with labor and materials, which the company did. The decorator personally supervised and controlled the work; performed some of the actual labor; completed his contract, and shortly afterwards collected from the owner the full contract price, but did not pay the wall paper company. The workmen furnished by that company were paid for it. Thereafter it sought to foreclose a lien for labor and materials. The Colorado Supreme Court held that, while one who furnishes labor and materials for a principal contractor may be entitled to a lien for his services, a person who furnishes laborers for the principal contractor and pays them is not entitled to a mechanics lien for moneys so expended, the Colorado lien act only providing that persons performing labor upon a building or furnishing materials therefor should have a lien. The plaintiff was therefore entitled to a lien only for the materials supplied. Kern *v.* Guiry Bros. Wall Paper Co., Colorado Supreme Court, 153 Pac. 87.

Right Reserved to Make Alterations—Liability of Sureties for Labor and Materials.

Action was brought on behalf of a number of persons who had furnished material for or bestowed labor on a school building against the sureties on the contractor's bond. The contract with the school district did not expressly guarantee the contractor's payment of claims against him for material and labor furnished in its construction, but required him, at his own cost and expense, to provide material and labor, and the contractor's bond undertook that the contractor should perform the conditions and agreements of the contract. It was held that the bond was not given for the sole benefit of the school district, but inured to the benefit of third parties furnishing labor and material to the contractor in its construction, and that the sureties were not relieved because the building was a public building not subject to the lien law.

The building contract contained the following provision: "Modification.—The owners reserve the right to make any additions to, omissions from, or change in, or substitution for, the work or material called for by the drawings and specifications, without notice to secure satisfactory compliance with the terms of the contract." Under the bond, construed along with this provision, it was held that changes from the contract by substituting a hollow brick wall for a solid stone wall, changing the floor and finish material from pine to hardwood, changing the location of rooms, and substituting a larger heating plant, made without notice to or consent of the sureties, and the excess cost of which was paid by the district, independently of the contract, was not so material as to relieve them from their liability to parties furnishing labor and materials in its construction. W. P. Fuller & Co. *v.* Alturas School Dist. (Cal.), 153 Pac. 743.

(*Continued page 91*)

HOUSE AND PLANS, H. I. MILLER, BARRINGTON, ILL. Marshall & Fox, Architects.

(*Continued from page 89*)

LUMBER CORPORATION AS SURETY ON CONTRACTORS' BOND.

A lumber company maintained a yard with a manager in charge. A property owner, purposing the erection of a building, consulted the company's manager, who recommended a contractor employed in connection with the yard, stating that lumber yards usually have a contractor around to bid on contracts, and that the company kept one so that it could sell the material for the entire contract; that the company would let the contractor have the material, and if the owner awarded him the contract, it would make his bond. The owner gave the contractor the contract, and the latter gave the owner a bond saving the owner harmless from pecuniary loss from breach of contract, on which the company became surety. The contract was performed according to the plans and specifications, and the owner paid the contractor the full contract price. At the time of the last payment, $350, paid on the written order of the company, the contractor owed the lumber company for material going into the building furnished by it more than $600 in excess thereof. The company sought to enforce a materialman's lien on the building for material furnished. It contended that it was not bound as surety on the bond, because it was beyond its corporate power to bind itself thereby.

It is the general doctrine that, in the absence of express or clearly implied statutory authority, a corporation cannot become an accommodation surety or guarantor. It was held, however, that the company was estopped to assert that its act in becoming surety was ultra vires, and as such surety it was estopped to maintain the action, in which, should it prevail the owner must necessarily suffer pecuniary loss by reason of the breach of the contract. Rounds & Porter Lumber Co. *v.* Thompson, Oklahoma Supreme Court, 153 Pac. 648.

CONSTRUCTION OF SCHOOL—EXCEEDING BOND ISSUE.

In a building contract for a school building for a specified sum, $35,940, it was agreed that no extras should be added except upon the signed order of the architect. Bonds were issued to the amount of $50,000. Thereafter a contract was let to another party for the plumbing, heating and ventilating plants, in the sum of $10,650. The contractor was ordered by the architect, in writing, to do certain extra work. After all the proceeds of the bonds had been expended, over $2,000 was owing to the contractor, and a small portion of the plumbing, heating and ventilating contract remained unpaid. In a suit by the contractor, it was held that he could recover for the extras furnished, since he had a right to rely on the school board's keeping further expenditures, aside from his contract, within the appropriation, and as his contract was valid when executed, action of the board in exceeding the appropriation in other details could not prevent his recovery. Rush *v.* School District No. 5 of Union County, Oregon Supreme Court, 153 Pac. 59.

SUB-CONTRACTORS EMPLOYED BY OWNER.

Sub-contractors sued the owner on a stop notice and the question on appeal was whether the evidence justified the trial judge in finding that there was an original contract between the sub-contractors and the owner and deciding in favor of the former. When the work which the plaintiffs had contracted to do for the general contractor was a little more than half done, they were going to quit. The owner said, "Go on and finish the work and I will pay you." It was held to be open for the court, sitting as a jury, to find that this was an original promise of the owner, and not merely a collateral promise to pay the general contractor's debt. The consideration was the new obligation that the plaintiffs came under—to work for the defendant rather than for the contractor. Paul *v.* Haber, New Jersey Court of Errors and Appeals, 96 Atl. 41.

MATERIALMAN'S LIEN.

The Delaware mechanic's lien statute provides that to entitle one to avail himself of the lien his contract must have been (*a*) with the owner of the building, (*b*) with his agent, or (*c*) with any contractor who shall have contracted for the erection, alteration, or repair of the building, and the furnishing of the whole or any part of the materials thereof. A materialman dealt with a sub-contractor unauthorized to contract either on behalf of the owner or the contractor. It was held that the materialman was not entitled to a lien under the statute.—Wilmington Sash & Door Co. (Del.) 95 Al. 902.

COMPLETION OF BUILDING—LAYING OF OAK FLOORS.

In an action for the cost of the pavement in front of three lots owned by the plaintiff, it appeared that he purchased the lots from the defendant, the contract providing that the plaintiff should erect on the lots a house of a specified value. It provided that the house should be completed by June 1, 1909. "Said completion to be evidenced by a certificate from S. A. Jennings, Architect." The plaintiff claimed that the time for the completion was extended for 30 days. The defendant would only concede that an extension of three weeks was granted. It was conceded that the completion was not evidenced by the certificate of the architect. On the question of time of completion depended the question of whether seller of purchaser of the lots was liable for an assessment levied against the property for the paving by the city, sometime after the date for completion (the 1st of July) of the street in front of the property. Oral evidence was introduced to the effect that the house was substantially completed by the 1st of July. This evidence was contradicted by the architect and other witnesses. It was conceded that the specifications called for oak floors in the building, and that these were not laid until long after July 1, 1909. This was a material part of the contract; and the omission to lay these floors within the time was held to show clearly that the building was not substantially completed. There were other items not completed until two or three months after July 1st. It was held that the building was not completed at that date, nor when the pavement was laid, and judgment for the plaintiff was affirmed. The Court was divided on the question whether, by the quoted provision of the contract, the architect had the power to finally determine the question whether the building was completed.—Colby *v.* Interlaken Land Co., Washington Supreme Court, 152 Pac. 994.

DISCHARGE OF UNPAID SURETIES.

The Oklahoma Supreme Court holds that a surety is bound only by the strict terms of his undertaking, and where he has assumed the burden without compensation, or sharing in the benefits, he has the right to prescribe the exact terms on which he will be bound; and where, in such case, the terms of the contract are changed without his consent, he is discharged, without regard to whether he is harmed or not by such change. The Court holds that this rule does not apply when the surety received compensation for becoming surety, or shares in the benefits of the contract. A builder's contract provided that estimates of material and labor were to be made each Saturday evening by the contractor and owner, and the amount of these estimates were to be paid at that time. This part of the contract was not observed. It was held that voluntary sureties on the contractor's bond were released. At the time the contract was signed and the bond given, the contract was silent as to the time within which the building should be completed, but afterwards, and without the consent of the sureties, the time was limited to 60 days. It was held that the sureties were thereby released. It should be kept in mind that the sureties were voluntary, unpaid, sureties.—Evatt *v.* Delaney (Okla.) 151 Pac. 607.

THE ARCHITECT'S SCRAP BOOK—HOUSES AT KENSINGTON, GREAT NECK, L. I.

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PLATES AND ILLUSTRATIONS

Editorial

The Proposed Zone System for New York—The President's Summer Home—Quantity Surveying

THERE has been formed recently in New York a commission on Building Districts and Restrictions, which commission has made some recommendations, not sufficiently far-reaching to accomplish all that the lover of New York might hope for, but sufficiently important so that their adoption will crystallize the character of the system of districts, as long as the restrictions are adhered to. The problem of New York real estate has been one which has caused anxiety to all investors; the property values have steadily increased in only a small portion of the city, and there are but few districts in New York in which the property values have not fluctuated violently. Some of these fluctuations have been due to the improvements in transportation, but many of them have been caused simply by a desire for novelty or change.

The most important of the single movements which has taken place recently is that which has brought the garment industry northward and westward, so that the district between 14th and 34th Streets in the immediate vicinity of Fifth Avenue, is now covered pretty solidly with loft buildings used for light manufacturing, and as these buildings pour great throngs of people into narrow streets in the morning, at the noon hour and at night, shops and business offices are swamped in the confusion, especially since these people have little purchasing power for the goods sold in the district in which their factories are situated.

This invasion of what used to be the high grade retail shopping district, has forced the stores and shops further up Fifth Avenue, until the entire space between 34th and 59th Streets along Fifth Avenue and along such of the adjoining side streets as are not covered by residence restrictions is occupied, and the shopping district has practically no way to expand except laterally; since at 59th Street, Central Park, splits the city into two distinctly different sections. Now the factories are beginning to invade even this district,and are becoming such

a menace to the property values in this district that the proposal has been made by the retail merchants, hotels, clubs, banks and other associations and firms which represent purchasing power, that after February first, 1917, they will decline to purchase any goods from factories located within this district, the hope being that all manufacturing can be thus kept out of the district.

The commission on Building Districts and Restrictions has divided up the city into areas restricted for residence purposes, for business purposes, or not restricted at all, and they have included in the portion restricted to business only the area between Seventh and Lexington Avenues, and 34th and 59th Streets, which the merchants of that district have also, as above described, agreed to keep inviolate as far as is in their power. The commission also made restrictions as to height, and to some extent as to the character of the buildings included within this area.

This is the first time in New York, and so far as comes to mind, the first time that any American city has proposed to define the areas in which business could be conducted. Of course the residential restriction on property is an old one, and has been valuable for certain purposes, and there seems to be no reason why property should not be restricted to other uses as well as to residential, but for a city to make and enforce such a restriction without the consent of the property holders on whose property the restriction is placed, is something novel and interesting. The passage of such a law would certainly seem to be for the good of the whole community, and it may be upheld on that ground, but it will probably be sustained only after it has been attacked in the courts.

We shall await with great interest the results of the plan prepared by the commission on Building Districts, and also that prepared by the retail merchants, banks, etc., and we wish more power to their arms.

THERE has been a great deal published in the papers about the summer home of the President at Elberon, and this house has been praised repeatedly as being a very wonderful example of American country house design, beautiful and elegant, and perfect in every respect.

Now there is practically no one thing which does more harm to the taste of the general public than to see just such pieces of design at this McCall house at Elberon, illustrated as beautiful and commendable. It seems a misfortune that the Chief Executive of our Nation has not selected for this coming summer a house as worthy of the best of our American tradition, as the house in which he has passed the last two summers of his tenure of office, and it is characteristic of the rather low standard of taste prevalent in the daily press of the United States, that this McCall house should have been so widely exploited as a beautiful piece of architecture, while the Churchill house was usually spoken of as a "pleasant, modest place."

There does not seem to be anything particular for us to do about it, and yet we believe that it should not be passed over without some editorial comment in this magazine, and we wish to urge all of our readers to let pass no opportunity of uplifting public taste by commending good architecture, and condemning bad, especially where it is in any sense a concern of the general public.

ONE of the English magazines calls attention to the fact that attempts are being made in the United States to establish the system of quantity surveying customary in England, but that these attempts are not being successful because they are not being made with sufficient intelligence and with sufficient thoroughness, to justify their adoption. To the writer this does not seem to be the reason for the failure of American architects and of the American public to adopt the English system. The quantity survey may have a use, and probably does have a use, or it would not be so extensively employed in English practice, but that it can eliminate the troubles from which we suffer under the present system seems hardly possible. It is perhaps true that if one could be absolutely sure that the quantities taken off by the quantity surveyor for estimate by the contractor were exactly correct, and that in case of any variation from this exact correctness, somebody beside the owner or the architect was going to suffer, the system might be permissible, but every architect who has worked with a contractor as he has taken off quantities or who has compared the quantities taken off by several contractors, knows that there is a good deal of latitude possible, and no architect can assume that quantities taken off by a surveyor are going to be more nearly exact than those taken off by an intelligent and careful contractor. In fact, the reverse would probably be the case, since a quantity surveyor would be careful never to under-estimate the amount of material or labor necessary to the completion of the building, but always the contrary.

There is a story told by an English architect regarding one of the contractors for his work which illustrates this point very well. It seems that this contractor for several years secured every bit of work from this particular architect's office on which competitive estimates were taken; the reason for it was finally discovered to be that the builder had found in the first job that the quantity surveyor had over-estimated his quantities about 10%, and in each succeeding job the contractor had checked the quantities and found them to run over in the same proportion. He therefore estimated on the cost of the building as shown on the drawings and specifications, and not on the cost of the quantities submitted by the surveyor.

The present system in this country is very far from being satisfactory, especially to the builders, since practically all of them spend a great deal of time in estimating jobs which they fail to secure, and the cost of this work must be charged up against those jobs which they do secure. The system, therefore, is not fair to any of the people concerned, since each job costs a builder more to figure than it legitimately should, and costs the owner more than it should, because the builder is charging to him some proportion of the cost of submitting estimates on work which he has not obtained. Such a system can be tolerated only when the lowest bidder is habitually chosen to do the work, and no architect should send out sets of plans to bidders that he may not accept if they should prove to be low. It is not fair or right to ask people to submit estimates simply for the purpose of checking other people's estimates, or to obtain these estimates with a view of beating down the desired bidder when his price is a little high, though this practice is frequently followed by contractors in dealing with sub-contractors, and by the very contractors who complain of it when practiced on themselves, by architects or owners. It is, however, sharp practice and unbecoming the dignity and decency of the architectural profession.

Practically all architects are working for the general uplift, not only of their own profession, but of the building trades, endeavoring to inculcate into the contractors with whom they do business, higher standards of business morals and business principles, and the building trades as a whole are endeavoring to find some way in which they can live up to a really high standard of mutual obligation between themselves and still keep in business. Therefore, it is incumbent upon the architects in every possible case to deal not only rightly, but fairly and decently with the bidders with whom they come in contact.